

## Self-regulation in the process of recovery from alcohol addiction according to Julius Kuhl's theory

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### Summary

**Aims:** The main aim of this study is to analyse the dynamics in self-regulation functions in connection with the treatment of people with alcohol addiction. Another goal is to compare two groups of people after a period of 1 year: those who maintained abstinence and those who relapsed.

**Method:** The studies were designed as longitudinal studies (three assessments) with quasi-experimental procedure (without a control group). The first assessment was performed during a 2-week period of treatment, the second one was performed at the end of the basic stage of treatment and the third one after 1 year. The data were collected in 12 centres treating addictions with similar treatment programmes on a group of 977 patients with a diagnosis of alcohol addiction (males 76%, females 24%). Self-regulation functions were assessed with Inventory SSI-K, where they are defined based on Kuhl's Personality Systems Interactions theory. A semi-structured interview was performed twice: at the beginning of treatment, in order to diagnose alcohol addiction disorders, and after 1 year of treatment, to analyse the indicator of recovery, which was defined as maintaining abstinence. In the evaluation of the dynamics of self-regulation functions, a two-way analysis of variance (ANOVA) was used.

**Conclusions:** Treatment and abstinence influence changes in self-regulation functions. The effects of these changes are mainly observed in people who maintained abstinence 1 year from starting their treatment, which indicates a stronger ability to act according to their own needs, facilitating the development of the 'Self'.

**self-regulation, personality, Personality System Interactions (PSI) theory, alcohol addiction, alcohol addiction treatment/therapy**

In order to conceptualize the term 'self-regulation', it is useful to consider adaptation according to Harmann's ego psychology, where adaptation is seen as a process present in the course of human life. This process ranges from a reactive adaptation to the environment to an intentional action directed at making changes in the environment and changes in oneself in order to better fit to the environment [1]. Self-regulation processes are crucial to adaptation. In Ju-

lius Kuhl's concept, self-regulation processes result from functions of personality theory and their interactions included in a broad Personality System Interaction (PSI) theory, which is being empirically verified and dynamically developed. This theory includes a hierarchical model of personality functioning and self-regulation processes as basic mechanisms supporting interactions of these systems [2]. Kuhl suggested looking at self-regulation as a two-way process. On the one hand there is broad understanding, which refers to all functions/regulators whose configurations change depending on the situation; they are different in different people and stem from a person's current needs and aims.

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On the other hand there is narrow understanding, a central regulation integrating information coming from experience and managing behaviour or mental condition in such a way that a person can set their own goals that they identify with, is able to make decisions and implement plans in spite of an awareness of a probability of prospective difficulties and situational obstacles. Understood in this way, self-regulation is a process concerning both the creation and implementation of goals consistent with the 'Self' that may be activated under the influence of hidden (unconscious) representations, crucial for forming adaptation.

Describing the process of setting the goals consistent with the 'Self', Kuhl [3] refers to the metaphor of 'internal democracy' in which various 'internal voices' are taken into account. Among the most important functions of self-regulation, three areas can be distinguished. The first is self-determination, consisting of an ability to identify oneself with the goals that are consistent with one's own needs. 'False internalization' can take place in some cases, but taking on others' goals as one's own can finally lead to the feeling of alienation. The second area refers to self-motivation, which is usually triggered in situations in which an activity is loaded with difficulties. This function allows to finish the task, *inter alia*, by neutralising an unpleasant emotional state and triggering positive mood. The third area is related to activation control that consists of self-activation in the scope of perception, vigilance, readiness to overcome difficulties, and an ability to self-soothe by a conscious reduction of internal tension, which in turn allows to focus on aspects that are important for goal completion.

Regarding self-regulation, the addictive types of behaviour, which are harmful for health, such as alcohol addiction, having a feature of an automated form of dealing with difficulties, can be eliminated by strengthening the self-regulation function. Learning new types of behaviour, beneficial for recovery from addiction, calls for

strengthening the ability to control one's own behaviour and a self-soothing ability, as well as an ability to reduce negative and trigger positive emotions. A crucial factor is identifying the aim of recovery as one's own, which allows to form one's activity intention and to start the volitional processes directed towards that goal. The conscious volitional processes are the criteria for the intentionality of actions, which can be influenced by unconscious contents hindering one's activities. The results of experimental and neurobiological studies point to an unconscious form of regulation, which is very important for clinical practice [2,4]. Owing to unconscious self-regulation, awareness is deprived of the load which is inscribed in crucial and complicated life decisions. Self-regulation takes into account a lot of needs, values (one's own and others') and other alternative possibilities of dealing with difficulties, i.e. activating self-control (cognitive and emotional – reduction of negative emotions), supporting the reduction of congruent needs and interests for achieving specific, planned and usually short-term goals. According to Kuhl's theory, the effectiveness of a volitional activity is the function of two factors: difficulties in completing the plan and effectiveness of volition, that is the ability to self-regulate [4,5,6].

Deficiencies in the scope of self-regulation on the one hand may favour the development of health disorders, and on the other are symptoms of mental decompensation [3,7]. Addiction is considered a failure of self-regulation<sup>1</sup> [9] as it makes it difficult to get to the person's basic needs and values, interfering with the development of 'Self'. Behavioural disorders related to alcohol misuse are integrated into the system of automated activities and the mechanisms of this disorder fit in the way of adaptation, in time leading to greater destruction. Drinking alcohol is the basic need of a person with alcohol addiction and as a result of their previous experiences related to the influence of alcohol, they may

<sup>1</sup> Self-regulation processes are not only the domain of psychology. In recent decades, neurobiological sciences delivered evidence on the participation of cerebral processes in decision-making and taking on the action strategies. Cerebral systems, especially the reward pathway, make psychological mechanisms understandable and may also help in decision-making and support targeted actions. For example: the reticular activating system, enabling data processing necessary for survival; the systems of the hippocampus, the striatum and the amygdala, crucial for the memory and learning processes; and the reward system, important in strengthening the stimuli by positive stimulation and having a crucial role in developing addiction to psychoactive substances [8].

expect it triggering and strengthening a positive affect or soothing the state of psychosomatic discomfort.

Recovery requires controlling the mechanisms of addiction and supporting volitional processes, which enable completing the treatment. Maintaining sobriety is recognised as a key condition allowing for self-regulation in the addicted person during the recovery process [10]. Many studies show that eliminating the toxic influence of alcohol on one's body can improve adaptation in as little as a few weeks, which may be related to improvement of self-regulation functions. According to international standards for the treatment of alcohol addiction, abstinence is the most desirable goal (e.g. NICE, NIAAA standards [11,12]).

In studies on self-regulation function (using Kuhl's concept) understood as an ability to set goals which are consistent with various representations of 'Self' and to implement plans which are important for the person, alcohol addicts had worse self-regulation than healthy controls, mainly in the scope of self-motivation and activation control (dependent on the stress load), self-determination and volitional inhibition [13]. Comparing a group of addicted patients with less than 6-week abstinence and a group of people with at least 6-month alcohol abstinence, what emerged was that the ability to exert self-control was better in the second group [14].

In longitudinal studies a group constantly maintaining alcohol abstinence for 1 year was compared with a group who relapsed within a year, after at least a few-week abstinence at the beginning of treatment. The abstainers were characterised by a greater ability to engage affective regulation, create goals consistent with 'Self' (i.e. with the person's needs and values), to trigger positive emotions and to re-evaluate negative experiences into positive, to experience the meaningfulness of their actions and to reduce internal tension. In both groups there were no significant differences between the level of self-regulation indicators at the beginning of treatment [15]. It appears that abstinence is an important regulator of functioning and being concerned

with maintaining abstinence is an internalised value. These results justify analysing addiction in terms of interfering with self-regulation and indicate the importance of strengthening the ability to regulate affect and volitional mechanisms in maintaining abstinence in addicts and its connection with improving internal motivation for abstinence behaviours [cf. Schlebusch et al. 2006 [16]. The studies referred to earlier have enabled us to form a research hypothesis that maintaining abstinence within 1 year supports improvement of the self-regulation abilities.

## AIM OF THE STUDY

Our aim was to analyse the dynamics of changes in the scope of self-regulation functions in connection with the treatment undertaken and abstinence in alcohol addicts, and a comparison of these changes between a group of people maintaining abstinence and those who went back to drinking after at least a few-week abstinence.<sup>1</sup>

## MATERIALS AND METHODS

The study was designed as a longitudinal study (three assessments) with quasi-experimental procedure (without a control group). The key difficulty in carrying out longitudinal studies among alcohol addicts are high drop-out rates, which are directly connected with the specifics of behaviour when using psychoactive substances. Therefore, a great number of patients who started the treatment in the 12 addiction centres in Poland were included in the first study. The first assessment was usually performed around the second week of treatment. The second assessment was done at the end of the basic stage of treatment (6th–8th week) in in-patient and day alcohol addiction treatment centres, and in the out-patient clinic after about 2.5–3 months from the beginning of treatment. The third assessment was performed after at least 1 year since starting the treatment programme. 650 in-

<sup>1</sup> The research is part of a project called "Patterns of functioning of alcohol addicts, their changes and role in the recovery process", which was presented in the monograph entitled *Personality Conditioning of the Dynamics of Recovery in Alcohol Addicts*, Medycyna Praktyczna Publishing House, Cracow 2013 (print run 100 copies, not for sale). Jagiellonian University Bioethics Committee Consent no: KBET/112/B/2009.

dividuals (67%) out of 977 patients who completed at least the basic therapeutic programme were chosen randomly for the study after 1 year, and an attempt to contact them was made. Patients without continuous contact with the centre were invited by telephone or e-mail to continue the study. The researchers were able to reach 251 people (39%) who agreed to contin-

ue the study, and the study was completed by 189 people.

Maintaining abstinence at 1 year was verified using an interview. Summing up, results from the first two assessments were analysed for the group of 977 people and 1 year later for 189 patients. Selected sociodemographic variables are presented in Table 1.

Table 1. Selected sociodemographic parameters of the study sample

Variables	Assessment 1 & 2 N = 977	Assessment 3, after 1 year		
		Whole sample N = 189	ABS N = 116 (61%)	nABS N = 73 (39%)
Age, years: mean (SD)	42.21 (10.77)	43.12 (9.94)	43.81 (9.93)	42.04 (9.93)
Men	76%	74%	77%	70%
Women	24%	26%	23%	30%
Education				
primary	14.8%	15.3%	8.6%	13.7%
vocational	40.3%	35.9%	37.9%	32.9%
secondary	33.5%	38.1%	33.6%	45.2%
higher	11.4%	10.6%	19.8%	8.2%
Professionally active	47.0%	53.4%	59.5%	43.8%

ABS, group maintaining 1-year abstinence; nABS, group who relapsed.

Taking into account a considerable homogeneity of the study sample, people diagnosed with psychopathological alcohol dependence syndrome, people addicted to drugs, people with severe cognitive dysfunctions significantly hindering participation in the study and people who did not agree to participate in the study were excluded. Therefore, only those who completed the initial treatment programme were included in the analysis. In Poland, this stage of treatment is similar across the treatment centres in terms of goals, impact structure and duration. The study was carried out in 2009–2011.

The mean age in the sample varied from 42 to 43 years and ranged from 23 to 70 years (men 43 years, women 41 years). The majority were aged between 40 and 50 years. People who claimed 1-year abstinence when starting treatment were more often professionally active. The greatest percentage of patients had vocational and secondary education. Most women in the study sample had secondary education (39% at first and second assessment and 45% after 1 year)

and most men had vocational education (33% and 30% respectively).

METHOD

The study on self-regulation functions was conducted using the Polish version of the SSI-short form (Germ. *Selbststeuerungs-Inventar-Kurzform*) (SSI-K) [6, 17]. We used Julius Kuhl’s Personality Systems Interactions theory (PSI) as a theoretical basis to define the self-regulation functions [3, 5, 18]. The SSI-K consists of 56 items, but only the self-regulation scale (12 items) was relevant to the study and its results are presented in this paper.

Self-regulation is described by three indicators.

- Self-motivation (*Selbstmotivierung*): ability to exert motivational control (*Motivationskontrolle*) and emotional control (*Emotionskontrolle*), which is an ability to self-motivate by revaluing negative experiences as positive experiences.



The higher the value, the more meaningful one’s own actions seem, helping to find positive motivation to engage in tasks, sometimes despite the obstacles, or reducing internal tension after unpleasant events.

- Activation control (*Aktivierungskontrolle*), which is related to an ability to adapt to situational circumstances. It includes an ability to ‘self-activate’ (*Selbstaktivierung*), to become vigilant, ready, sensible when faced by obstacles or challenges, as well as an ability to self-soothe (*Selbstberuhigung*).
- Self-determination (*Selbstbestimmung*), that is, identifying with one’s own goals, consistency of the goals with

needs, values, attitudes (*Selbstkongruenz*). Implementation of these goals enables joyful experiencing of their sense (*Optimismus*).<end of list>

Respondents assess the extent the sentences that describe functioning apply to them on a four-point scale. Raw scores on each of the scales range from 0 to 12 points. Cornbach’s alpha reliability of internal consistency of scales in the original German version was 0.66 to 0.90, and 0.60 to 0.89 in the Polish version. In the study sample, the reliability of internal consistency for the whole inventory was estimated at the level of 0.76 (Cronbach’s alpha for particular scales 0.71–0.79) [15]. A comparison of the reliability of internal scales of self-regulation in SSI-K is presented in Table 2.

**Table 2.** Internal reliability of self-regulation scales from the Self-Steering Inventory (SSI-K): a comparison of German and Polish versions

Scales	Cronbach’s alpha		
	German version <sup>1</sup>	Polish version	
		Blaszczyk-Schiep study <sup>2</sup>	Current study
Self-regulation (indicators 1+2+3)	0.86	0.85	0.88
Self-motivation	0.78	0.64	0.78
Activation control	0.66	0.74	0.79
Self-determination	0.79	0.70	0.78

<sup>1</sup> Kuhl & Fuhrmann 1998;

<sup>2</sup> Research in a group after a suicide attempt [17]

Written consent was obtained from Julius Kuhl and Dr Sybilia Blaszczyk-Schiep for using the SSI-K and SSI-K Polish version.

A semi-structured interview was conducted twice. At the beginning of treatment the interview referred to the diagnosis of alcohol addiction; after 1 year we looked at maintaining abstinence. Abstinence was defined as total withdrawal from alcohol consumption. Abstinence is generally seen as an indicator of recovery. The so-called early abstinence lasts from 1 month to 1 year, and when it lasts longer it is considered permanent.

To verify the dynamics of changes in self-regulation in the context of maintaining abstinence, a two-factor analysis of variance (ANOVA) was

conducted. When interaction was statistically significant, comparisons planned for the differences between individual assessments were made separately in groups with respect to abstinence, differences between groups and separately for the three assessments. Eta-squared effect size according to Cohen’s interpretation was established: small effect size to 0.01 (1% of explained variance), medium to 0.06 and large to 0.14 (so, 0.10 (10%) will be described as “effect size between medium and large”) [19].

RESULTS

We will begin by presenting the descriptive statistics of self-regulation indicators (Table 3).

**Table 3.** Descriptive statistics of self-regulation indicators at three assessments.

	Assessment					
	1	2	3	1	2	3
Self-regulation indicators	Mean (SD)			Median		
Self-motivation	6.07 (2.34)	6.64 (2.19)	6.39 (2.23)	6	7	6
Activation control	6.21 (2.33)	6.71 (2.16)	6.72 (2.40)	6	7	7
Self-determination	7.89 (2.20)	8.34 (2.07)	8.06 (2.11)	8	9	8

The results of studies referring to the variability of self-regulation indicators, where the functions, according to a quasi-experimental procedure (experimental, without a control group) were recognised as dependent variables, will be presented next. The independent variable was

abstinence, which constitutes an indicator of recovery.

Table 4 presents the differences between the assessments performed using ANOVA, separately in ABS and nABS groups (planned comparisons).

**Table 4.** Differences between assessments of self-regulation indicators in the abstinent (ABS) and non-abstinent (nABS) groups.

Self-regulation indicators	Group	Assessment	Difference in means		Statistical error		p		Eta <sup>2</sup> p	
			Assessment		Assessment		Assessment		Assessment	
			2	3	2	3	2	3	2	3
Self-motivation	ABS	1	−0.53	−0.48	0.20	0.25	0.008	0.057	0.05	0.02
		2		0.04		0.25		0.861		<0.01
	nABS	1	−0.17	0.40	0.24	0.32	0.482	0.210	<0.01	0.01
		2		0.57		0.31		0.072		0.02
Activation control	ABS	1	−0.47	−0.59	0.21	0.26	0.023	0.026	0.03	0.03
		2		−0.12		0.25		0.629		<0.01
	nABS	1	−0.28	−0.16	0.26	0.33	0.287	0.639	0.01	<0.01
		2		0.12		0.31		0.700		<0.01
Self-determination	ABS	1	−0.21	−0.14	0.20	0.22	0.290	0.514	0.01	<0.01
		2		0.07		0.22		0.770		<0.01
	nABS	1	−0.40	0.21	0.25	0.27	0.109	0.450	0.02	<0.01
		2		0.60		0.28		0.034		0.03

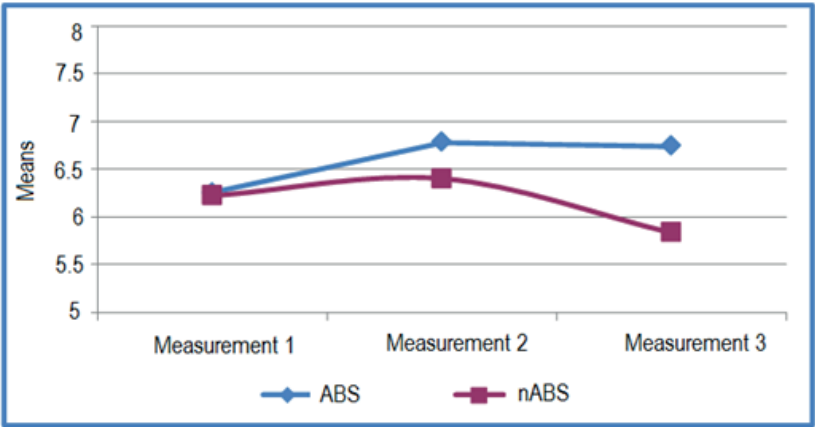
In the ABS group the change was statistically significant between the first and second assessment on the self-motivation variable ( $p = 0.008$ ,  $\eta^2 p = 0.05$ ) and the activation control variable, ( $p = 0.023$ ,  $\eta^2 p = 0.03$ ), where change was also significant between the first and third assessment ( $p = 0.026$ ,  $\eta^2 p = 0.03$ ). The remaining differences between the assessment in these 2 groups were

not statistically significant. In the nABS group change was statistically significant between the second and third assessment ( $p = 0.034$ ,  $\eta^2 p = 0.03$ ) on the self-determination variable, with the average effect size of changes ( $\eta^2$ ). The differences between the assessments were analysed separately in ABS and nABS groups (ANOVA, planned comparisons) (Table 5).

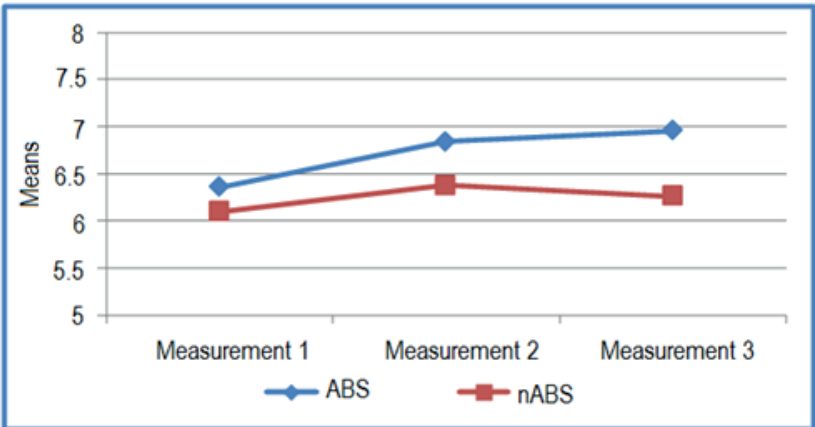
**Table 5.** The differences between the abstinent (ABS) and not-abstinent (nABS) groups at the 3 assessment points (ANOVA, planned comparisons)

Self-regulation indicators	Assessment	Difference	Statistical error	<i>p</i>	Eta <sup>2</sup> <i>p</i>
Self-motivation	1	0.03	0.39	0.942	0.00
	2	0.38	0.37	0.300	0.01
	3	0.91	0.36	0.012	0.04
Activation control	1	0.26	0.40	0.517	0.00
	2	0.46	0.36	0.206	0.01
	3	0.70	0.41	0.087	0.02
Self-determination	1	0.38	0.34	0.270	0.01
	2	0.19	0.36	0.594	0.00
	3	0.73	0.33	0.029	0.03

After 1 year of therapy the difference between ABS and nABS groups was statistically significant, with medium eta<sup>2</sup> in the third assessment within the self-motivation variable ( $p = 0.012$ , eta<sup>2</sup>  $p = 0.04$ ), and self-determination variable ( $p = 0.029$ , eta<sup>2</sup>  $p = 0.03$ ). Figures 1–3 illustrate these results.



**Figure 1.** The average results of particular assessments for self-motivation in ABS and nABS groups



**Figure 2.** The average results of particular assessments for activation control in ABS and nABS groups

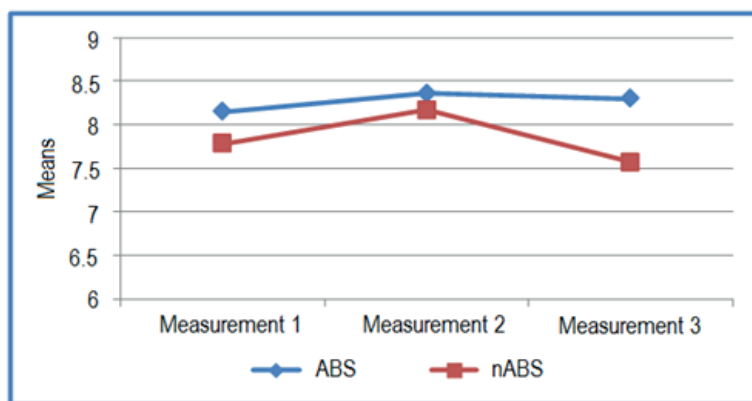


Figure 3. The average results of particular assessments for self-determination in ABS and nABS groups

## DISCUSSION

The results strengthen the hypothesis that the length of the period of abstinence is directly related to the development of self-regulation. They confirm that analysing addiction in the categories of affection regulation and volitional mechanisms impairment indicates the importance of strengthening self-regulation mechanisms in maintaining abstinence, and its relation to the improvement of internal motivation to abstinent attitudes [16].

Self-regulation, referring to identifying needs, accomplishing goals consistent with 'Self' and integrating experiences, is based on positive affect; it promotes an accomplishment of long-term goals, for example maintaining stable abstinence that aids recovery in addiction. The results of the analyses allow researchers to answer the question on the dynamics of changes in the self-regulation function.

The ability to self-regulate in the areas of self-motivation and activation control increased in people with one-year abstinence. These changes were achieved at the beginning of treatment and remained 1 year later. This indicates an improvement in the ability to create goals consistent with the representations of 'Self' and with integrating these experiences, abilities to trigger positive affect and to self-motivate as well as to find sense in one's actions and make positive revaluation of negative events. Moreover, change in this group is related to the ability to develop an active attitude in case of difficulties and an ability to self-soothe in stressful situations or in case of failure.

However, there was a significant decrease of self-determination function in subjects who, in the period between completing the basic treatment and the assessment after 1 year, went back to drinking alcohol. That means that there was a significant reduction in the ability to identify with their goals, needs and values, which supports strengthening positive affect and is meaningful for a person in the nABS group who had at least a few weeks of abstinence. One of the possible explanations for this change may be related to a situation where respondents, through abstinence and treatment, started to recover and feel better. If going back to drinking alcohol is considered a failure, it may be related to crisis based on weaker identification of one's needs and goals connected with the development of 'Self'. Intense emotional tension, especially of negative emotions, does not promote self-motivation to change alcoholic behaviour [20].

In clinical practice it is relevant to create circumstances (e.g. by means of short interventions or structured behavioural therapy) and setting goals which at the beginning may not have the features of identification with 'Self' and can be instrumentally conditioned. It seems, therefore, that detoxification and working on identifying aims, seeking both personal and situational resources, create a chance for mobilisation of the process of building internal motivation, developing the ambiguity of "to drink/not to drink", strengthening volitional competences as well as making decisions and acting. Contemporary understanding of motivation includes a number of psychological constructs. The models of change analyse the process of motivation in the context



of intentions, beliefs, decision-making, the degree of commitment, the sense of effectiveness, as well as ways of self-regulation in the context of increasing problems with alcohol and their consequences, facing stressful situations, psychopathological symptoms and drinking alcohol in the company of others, or support of the environment [21].

Noticing the problem of alcohol misuse and its influence on one's life, experiencing crises in relation to the damage resulting from alcohol misuse, or a reflection coming along with an assessment of one's own functioning in the context of values and other life goals may evoke the need for change and start the action which might limit or reduce the influence of alcohol behaviour on the process of adaptation. The power of motivation does not directly influence goal achievement but motivation itself helps to make a decision to accomplish the task ("that's what I want"). However, an intentional change and overcoming difficulties are achieved by volitional processes [2, 6]. A person can intentionally shape their own way of adaptation because humans have an ability to self-regulate which is considered by many researches as the most important element in the adaptation process. And it is the ability to self-regulate, though it can be impaired, that helps the addicted person to start and maintain the processes allowing for recovery, and secondarily to develop self-regulation competences.

## CONCLUSIONS

Therapy and abstinence influence changes in self-regulation functions and the effects of these changes are observed in people who have maintained abstinence from alcohol for 1 year. In patients returning to drinking in the period of stabilization, the level of self-determination decreases, a process which may be related to a poor ability to act in accordance with one's own desires that might have been identified and triggered during the period of abstinence. In the study sample grounded abstinence, self-regulation functions, which ensure the development of 'Self', as well as an ability to act in accordance with one's own needs, were gradually strengthened.

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